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# PROPOSED PROGRAMME BUDGET FOR THE BIENNIUM 1994-1995

## United Nations telecommunications system

## Report of the Secretary-General

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# I. INTRODUCTION

1. It will be recalled that, in 1989, the Plenipotentiary Conference of the International Telecommunication Union (ITU) decided by its resolution COM 8/1:

> "that the United Nations telecommunications network may carry the traffic of the specialized agencies which participate voluntarily on condition that the specialized agencies would pay for the telecommunications service based on the expenses of operating the service by the United Nations and tariffs, established by administrations within the framework of current regulations and practices;".

2. In keeping with this resolution, at its Board of Governors meeting in September 1992, the International Telecommunications Satellite Organization (INTELSAT) lifted the restrictions on the development and operation of a United Nations global satellite network. On 11 March 1993, the Secretary-General of the United Nations and the Director-General of INTELSAT signed an amendment to the agreement for the leasing of space segment capacity, which authorized the expanded use of INTELSAT satellites by the United Nations. As a result, the United Nations is in the unique position of being able to extend to the United Nations common system the efficiencies and economies of its own network.

3. Recognizing the importance of telecommunications in the daily operations and management of the United Nations common system, the Secretary-General presented a report on the status of telecommunications activities in the United Nations (A/C.5/46/5). In part B, section V, of resolution 46/185, the General Assembly, inter alia, took note of the report of the Secretary-General and endorsed the comments and recommendations of the Advisory Committee on Administrative and Budgetary Questions (ACABQ) contained in its report (A/46/7/Add.12). ACABQ indicated that the operational arrangements for implementation of a private global network needed to be further developed together with detailed cost estimates, in close consultation with the specialized agencies. The Committee also recommended that at such time as the operational plan was clearly worked out and agreed to by the specialized agencies, a comprehensive proposal for expansion of the existing telecommunications network should be submitted in a report to the General Assembly, including the implementation schedule, cost estimates and plan of financing.

4. In view of the significant savings that could be achieved from the implementation of the satellite network, in April 1993, a report was submitted to ACABQ proposing a satellite backbone network to meet current urgent requirements of the United Nations, including the total project budget, cost-benefit analysis and implementation schedule. Following its review of those proposals, the Advisory Committee, while welcoming the benefits outlined in the report, indicated that final approval of the proposals would have to be sought from the General Assembly at its forty-eighth session. The present report includes additional information that the Committee indicated should be presented to the Assembly.

5. The proposals outlined in the foregoing paragraphs relate to the installation of seven Earth stations: one each at the seat of the regional commissions at Addis Ababa, Bangkok, Santiago and Amman; one at the United Nations Office at Nairobi and two at the United Nations Office at Geneva. It is designed to meet the United Nations own requirements, and would enhance connectivity between United Nations Headquarters and its regional commissions and field offices, as well as with the specialized agencies. The network would also be expanded and configured to meet peace-keeping and humanitarian requirements. In some cases, the satellite would replace existing leased circuits and in other areas it would work in conjunction with commercial fibre-optic terrestrial systems and digital microwave communications links.

6. Based on an implementation schedule, the cost of the project during the 1994-1995 biennium is estimated at $16,928,100, of which $8,739,300 relates to the one-time cost of the installation and integration of the enhanced telecommunications system and $8,188,800 relates to the operation and management of the network. Of the total cost required, however, it is estimated that $5,250,600 could be met from existing resources currently allocated to telecommunications under the regular budget and $8,615,700 could be met from savings to be derived from communications requirements of the peace-keeping missions.

7. The total additional costs from the regular budget during the 1994-1995 biennium is thus estimated at $3,061,800.

## II. BACKGROUND AND APPROACH TO THE SATELLITE NETWORK

### A. Present status of the United Nations telecommunications network

8. Presently, the United Nations uses leased analog alternate voice and data (AVD) circuits, leased digital circuits for integrated voice and data services and a number of United Nations-owned satellite Earth stations operating on the INTELSAT system. The leased circuits provide most of the administrative telecommunications services between Headquarters, the regional commissions (Economic Commission for Europe (ECE), Economic Commission for Asia and the Pacific (ESCAP), Economic Commission for Latin America and the Caribbean (ECLAC), Economic Commission for Africa (ECA), and Economic Commission for Western Asia (ESCWA), the United Nations Office at Nairobi, the United Nations Development Programme (UNDP)) and other United Nations offices. The satellite portion of the network encompasses United Nations-owned satellite Earth stations ranging from 1.8 to 11 metre antennae, with circuits operating under a lease agreement with INTELSAT. The satellite network is jointly operated by the Electronic Services Division of the Office of General Services and the Field Operations Division of the Department of Peace-keeping Operations. While the satellite network supports mostly peace-keeping needs, some operational traffic is also routed over the network. Both the leased lines and the satellite networks rely on the use of commercial facilities through major carriers including the facilities of the International Maritime Satellite Organization (INMARSAT). The private network and commercial facilities provide voice, data, telex, facsimile and cablegram facilities, including both standard and

cryptographic capabilities. The networks are also shared with some of the specialized agencies and other United Nations users.

9. Owing to the high operating costs of commercial services, the inherent limitations of the AVD circuits and the lifting of the ITU and INTELSAT restrictions, the United Nations is now concentrating its efforts on converting its many services to a United Nations-owned totally integrated digital satellite network that will provide a rapid, reliable and economic solution to its communication requirements.

## B. Network options considered

10. Following the General Assembly's consideration of the report to its forty-sixth session, the Electronic Services Division, in close association with ITU, carried out a study addressing the cost-benefit analysis and service-quality issues of a private global integrated telecommunications network which would be available to the United Nations and the specialized agencies. Several options were examined to meet the telecommunications requirements of the United Nations system. The question of whether a private United Nations network was desirable and, if so, what network technologies were viable, taking into account the various implications (technical, financial and managerial), was also addressed. The three basic options considered in a cost-benefit study undertaken by a consultant were as follows: (a) a fully commercial network; (b) a private leased-line network combined with commercial services; and (c) a private satellite network combined with commercial services. The respective characteristics of the three network options are indicated below:

(a) Commercial carrier network. The commercial carrier network requires a very small capital investment cost but gives rise to substantial recurring charges that are directly proportional to usage. The higher the usage, therefore, the higher the costs. The cost of services on a fully commercial network is strictly dependent on traffic volumes and can be considered as a straight-line projection, with the unit charges remaining essentially constant. Since the volume of United Nations traffic is high and relatively predictable between Headquarters and overseas offices, a fully commercial network will not be well suited to the United Nations. Furthermore, commercial services are either limited or not available in most peace-keeping locations, such as the United Nations Operations in Somalia (UNOSOM) or the United Nations Protection Force (UNPROFOR) in Zagreb. The commercial carrier option becomes even less attractive if the traffic of the specialized agencies is considered;

(b) Leased-line network. The leased-line network has fixed charges for each line, regardless of usage. The leased-line network is combined with commercial services, with charges based on usage, for those locations not accessible on the leased-line network. This is a cost-effective network when the bulk of the traffic is predictable and primarily point to point. Although this configuration represents the current United Nations network, it is not adequate to meet the Organization's growing telecommunication requirements. An expansion of the leased-lines to meet these requirements would still leave many areas without coverage;

(c) Satellite network. Satellite networks are not subject to the limitations of a point-to-point leased-line network. The satellite network solution will allow rapid network deployment, instantaneous and flexible connectivity between Earth stations over vast geographic locations for peace-keeping missions and any other United Nations telecommunication requirements at short notice. As a result, a larger proportion of traffic will be handled on the United Nations network and a smaller proportion will be subject to commercial charges. The higher the volume of traffic on the United Nations-owned network, the lower the unit cost. This configuration is cost-effective for organizations with high volumes of traffic from multiple sources. While a satellite network requires substantial initial capital investment, for both equipment and installation, recurring costs for the operation of the network over its useful life are low.

11. Following the consideration of a variety of technologies, the study concluded that a satellite-based telecommunications network with a terrestrial backup would be the most cost-effective configuration for the United Nations. The satellite-based network would not only be most cost-effective but would also provide the quality and range of service desired by the United Nations.

### C. Participation of specialized agencies in the development of the network

12. The specialized agencies' involvement with the concept of a satellite network for the United Nations common system goes back to 1991 when the United Nations presented the concept of a satellite-based network to the technical panel on telecommunications of the Advisory Committee for the Coordination of Information Systems (ACCIS) in the context of a report entitled "The United Nations telecommunications strategy paper". The strategic direction outlined in that report was that the best approach to providing transmission facilities for the network, both technically and economically, was to use United Nations-owned Earth stations and satellite transponder capacity leased directly from INTELSAT. That approach gave technical latitude in design and system implementation and was the least expensive of all possible alternatives. The concept of a satellite-based network was well received by the specialized agencies who expressed interest in participating in the network once established.

13. On 18 May 1993, 14 representatives from the United Nations common system participated in the inter-agency meeting on telecommunications plans, which was convened by the United Nations in New York. Presentations on the development of the network were given by the United Nations, ITU and INTELSAT, followed by discussions on the telecommunications plans and requirements on the part of the other United Nations programmes and specialized agencies.

14. A significant result of the meeting was the establishment of an overall framework for the coordination of telecommunications activities on the part of the United Nations and the specialized agencies. It was agreed that an inter-agency coordinating committee on telecommunications would be established to ensure that full cooperation was achieved in meeting the telecommunications requirements of the common system, and that two inter-agency working groups would be established: one, chaired by the United Nations, would monitor the

development of the United Nations backbone satellite network; and the other, chaired by the Office of the United Nations High Commissioner for Refugees (UNHCR), would plan and develop the telecommunications requirements of the field agencies at the local level. The initial meetings of each of the two working groups took place in New York on 7 and 8 July 1993 respectively.

15. Although the other organizations are participating in the discussions for the development of a global telecommunications network, at this point, most organizations are not prepared to finance a global telecommunications network before it becomes operational. On the other hand, since the Secretary-General believes that an improved United Nations telecommunications network will not only be cost-effective but will also be responsive to the daily operations of the United Nations in such vital areas as peace-keeping operations, humanitarian activities and preventive diplomacy, the improvement of the United Nations telecommunications system, geared exclusively to the needs of the United Nations, is being proposed. The proposed backbone satellite network and its facilities would also benefit other organizations within the common system since these would be made available to those organizations on a reimbursable basis, including a 1 per cent add-on charge to the United Nations unit rate to recover the capital costs of the network.

## D. Objective of the proposed satellite network

16. The ultimate goal of the network is to improve the availability and efficiency of a global integrated digital telecommunications system with the capability of supporting voice, telex, facsimile, electronic mail packages, data communications, documents handling and video-conferencing over the same network. Other goals are to reduce expenditures on commercial carrier networks and to minimize the security risk in the field by operating, as far as possible, independent telecommunications facilities.

17. The initial phase of the satellite network would link Headquarters with the regional commissions and the United Nations offices at Geneva, Vienna and Nairobi and would in addition provide a telecommunications highway for peace-keeping missions, no matter where these may be located. This is the proposed backbone network.

## E. Subsequent phases

18. The network would be developed gradually. The first phase would be the implementation of the proposed backbone network upon which the feeder network will be connected. The subsequent phases would be the installation of small Earth stations (feeder network) to serve other overseas offices of the Organization and of other organizations in the common system. These installations would be justified on the basis of the level of traffic generated. The specialized agencies' requirements could, therefore, be met as the network develops. Small Earth stations would thus be installed on demand by these agencies provided the Earth station meets the global network specifications. It is against this concept that the Inter-agency Coordinating Committee on the

development of the United Nations global satellite telecommunications network, mentioned above, was established in May 1993.

## F. Analysis of telecommunications traffic

19. The United Nations maintains detailed records of its outgoing telecommunications traffic from Headquarters to overseas destinations. However, records of traffic from overseas offices to Headquarters and between overseas offices are sparse and often not available. Voice traffic from Headquarters is recorded in a number of ways. For example, traffic is recorded by destination, so that the number of minutes and charges for each destination for telephone or facsimile can be identified. Records are also maintained by user organizations or departments and are divided between those units that are charged for services and those that are not. Furthermore, the traffic is recorded by carrier and charges for all commercial carriers are maintained. Similar records are maintained for telex and cable messages.

20. Currently, on average the United Nations experiences some 5 million minutes of voice traffic per year of which 2.4 million minutes are from Headquarters over commercial carrier networks. This traffic costs the Organization approximately $4.2 million annually. As regards peace-keeping operations, the estimated annual telecommunications expenditures of $15 million is obtained from actual invoices from peace-keeping missions. The charges from INMARSAT and national posts and telecommunications authorities average $6.50 to $7 per minute in support of peace-keeping missions. From this, the traffic volume of 2.3 million minutes is derived. The higher costs experienced by the peace-keeping missions are due to the relatively high rates charged by INMARSAT and the local authorities for international calls.

21. To be able to carry out more complete traffic data analysis for network costing, a number of procedures will be introduced. The new digital private automatic branch exchange (PABX) switches being installed at overseas offices will be programmed to collect traffic data automatically. Direct measurement of traffic data on outgoing lines connecting all United Nations switches with public networks, leased lines and the collection of traffic data from public operators will be established in the network system. The results of future traffic analysis will be used to review the network costing and tariffs.

## G. Comparison of rates between commercial carriers and the United Nations network

22. In order to assess the savings derived from the use of the United Nations telecommunications network, comparisons of the rates charged by commercial carriers and those charged by the organizations have been prepared (see annexes I and II). For a valid cost comparison between a commercial carrier and the United Nations network, the rates of the respective networks to the same destinations were examined. The current United Nations network covers 18 destinations. Additional destinations would be phased in under the satellite network. The Organization's network rates are based on recovering the costs of operation of the service and on tariffs established by administrations, in

accordance with ITU resolution COM 8/1. Annex I compares the rates for telephone service originating from New York charged by commercial carriers versus the rates charged by the Organization. It should be noted that the rates indicated under "commercial rates" represent an average of several commercial carriers. Annex I also shows the rates for outgoing calls from the New York telephone switch to destinations on the leased-line network. As indicated in that annex, incoming calls to New York and other destinations via the national posts and telecommunications authorities are much higher. Incoming calls to New York from various duty stations, which are intended for destinations beyond New York, are routed via the United Nations leased circuits. In these cases, the rate charged is the rate from New York to the final destination. Annex II compares the charges for telex traffic among duty stations with the United Nations rates. Under the column headed "New York" a comparison of the average commercial rates and the United Nations rate from Headquarters on the United Nations network to other duty stations is shown.

23. The conclusion drawn from these annexes is that a fully commercial network would not be cost-effective for the United Nations and that significant savings could be derived from the operation of a private telecommunications network.

## III. ENGINEERING OF THE PROPOSED SATELLITE NETWORK

### A. Review of services available from satellite system providers

24. In order to determine the most cost-effective satellite network that would meet the Organization's expanding telecommunications requirements, a comprehensive review of the two primary services available from satellite system providers was carried out, namely, the INTELSAT international business service (IBS) and the very small aperture terminals (VSAT) service. IBS is a totally integrated digital service designed to meet the private network needs of multinational corporations and organizations. This service supports voice, data, facsimile, telex and video-conferencing. The VSAT-type network is generally designed to provide data communications between a single large hub Earth station and multiple smaller Earth stations at an unlimited number of remote sites. VSAT networks are in common use in meeting business and financial industry needs, for example, for hotel reservations and credit card verifications, etc., and are particularly effective in covering large data network requirements.

25. The United Nations telecommunications requirements consist of different types of services at widespread geographic locations and cannot be met independently by the IBS or the VSAT network solution alone. Therefore, an appropriate mix of both IBS and VSAT network would be used as and when required. The IBS network would be used for the heavy traffic routes, i.e. the backbone satellite network, thus avoiding multiple connections through individual leased lines (AVD circuits). In order to respond to the diversity and ad hoc nature of peace-keeping activities and the specialized agencies' needs, the VSAT network would be used.

## B. Network design considerations

26. The overall network design concept is presented in figure 1. As far as possible, in each of the identified countries, satellite Earth stations will be installed on United Nations premises with ground communications equipment housed together with other backbone nodal equipment, such as PABX, multiplexers and packet switches. The exact locations of the equipment will be determined by consultation and agreement with individual United Nations offices.

27. Full connectivity of the United Nations telecommunications network will require the use of three geostationary satellites with three hub stations, one located at United Nations Headquarters in New York, one in Geneva and the third in East Asia to access the Atlantic Ocean region, the Indian Ocean region and the Pacific Ocean region satellites respectively. However, as short- and medium-term solutions, it is suggested that the Earth station at Headquarters be upgraded to serve as the primary hub station for the Atlantic Ocean region satellite and a second hub station will be installed in Geneva for the Indian Ocean region satellite. As an alternative to the North Atlantic fibre-optic cables currently used, a second Atlantic Ocean region satellite Earth station will be installed at the European hub. However, a single fibre-optic cable link will be retained to carry delay sensitive traffic and act as a backup to the satellite network. The second European hub Earth station will not only replace the European/New York fibre-optic cable, but will serve as a major transit hub station for peace-keeping by providing direct communications to United Nations offices and specialized agencies in Europe.

28. The location and implementation of the third hub Earth station to serve the Pacific Ocean region satellite will be determined after further investigation of traffic patterns in that part of the world. Schematically, the connectivity plan of the proposed network is as depicted in figure 1.

### European hub Earth stations

29. The European hub Earth stations will provide connectivity to African, Asian, and Middle Eastern countries working on the Atlantic Ocean region and Indian Ocean region satellites. The hub stations will also serve as a collection centre for all current and proposed European leased circuits to Headquarters, i.e., Vienna, Copenhagen, Paris, Rome and London.

30. An alternative to the European leased circuits is the installation of Earth stations at these locations. However, further detailed study of traffic volume would be needed before installation of individual Earth stations at these locations could be justified.

31. The European hub stations will have the capability of not only providing services to ongoing peace-keeping missions such as UNOSOM and UNPROFOR, but also to all future peace-keeping operations. This will substantially reduce INMARSAT and local national posts and telecommunications authorities charges for long-distance telephone calls between field missions and Headquarters. With the installation of the European hub stations, the need to build a hub Earth station for each new peace-keeping mission will almost be eliminated.

Addis Ababa, Nairobi and Santiago

32. The regional commissions at Addis Ababa and Santiago and the United Nations Office at Nairobi, as well as the specialized agencies, will be connected via the Atlantic Ocean region satellite directly to either United Nations Headquarters in New York or to the European hub Earth stations. Onward transmissions will be routed on leased circuits or commercial carriers services to the final destinations. At each of the regional commissions, telecommunications services between subregional field offices and the regional headquarters or home offices will also be possible.

Bangkok and Amman

33. ESCAP and ESCWA and other United Nations offices at Amman and Bangkok will be connected to United Nations Headquarters via the European hub stations, using both the Indian Ocean region and Atlantic Ocean region satellites. While an alternative connection for these stations would be through the Naqoura Earth stations, given the United Nations traffic volume and the availability of the North Atlantic fibre-optic cable as backup, the European hub will be used as the primary transit route.

## IV. ORGANIZATIONAL AND MANAGEMENT STRUCTURE

34. The major challenges of managing the enhanced digital telecommunications network are the need to provide continuous operation and availability of services at the lowest reasonable cost to end-users. Included in the cost element is the plan to operate the proposed satellite backbone network with a minimum staffing approach consistent with the required continuity of services. This in turn means that the backbone network hub Earth stations in New York and Europe will be a 24-hour operation with minimum shift staffing. The remaining Earth stations at the regional commissions and Nairobi will operate unattended during the evening and night shifts.

35. To support the foregoing operational plan, a fully integrated monitoring, alarm and control system is designed into the network and will be installed in New York and at the European hub Earth stations. The system will monitor and control all major equipment units to ensure continuous unattended operation with automatic changeover of faulty units by remote control from New York or the European hub stations.

36. In addition, a centralized personal computer-based spare parts management system will be administered from New York. The system will monitor spare parts and equipment units, with manufacturer and part or unit reference number, at each Earth station. The system will also contain reordering procedures.

37. The telecommunications network, including the proposed satellite backbone network, will continue to be under the control of the Department of Administration and Management of the Secretariat. Planning, engineering, procurement, billing and charge back, staffing and day-to-day management will continue to be in the Office of General Services. Close coordination with the Department of Peace-keeping Operations will continue so as to ensure full

support to the peace-keeping missions. Supervision of the peace-keeping field telecommunications will continue to be under the control of the Department of Peace-keeping Operations.

38. Telecommunication management at the regional commissions and Nairobi is currently under the respective building management units of those offices. In most cases, messaging services are provided by field service staff of the Field Operations Division funded by the regular budget and outposted to those duty stations. Practically all functions of the building management units pertaining to telecommunications services management at those locations are administrative in nature and are, therefore, inadequate for the effective operation and maintenance of the complex internetworking telecommunications systems that are currently being installed or expected to be installed at those offices.

39. For efficient management, operations and maintenance of the United Nations telecommunications system, which needs to be responsive to the demands of peace-keeping and humanitarian activities and the extensive exchange of administrative communications taking place among various duty stations, it is proposed to strengthen the Telecommunication Services Section at the Office of General Services/Electronic Services Division and to establish a separate telecommunications services at each regional commission and Nairobi unit with responsibility for system engineering, operation and administration.

40. The main functions of the proposed telecommunications services units will be the overall management of the telecommunication services and system engineering aspects. In close coordination with the Office of General Services/Electronic Services Division at Headquarters, these units will carry out planning and budgeting for the system; establish and enforce operations and maintenance procedures; administer all local telecommunications contracts and ensure system security; and carry out administrative functions such as ordering and procurement of telecommunication equipment and services, billing and charge back of client accounts, preparing databases of telecommunication services and users, maintaining established operational procedures, training users in new telecommunication services and operations and updating the local component of the centralized spare parts management system. An organizational structure for the proposed units has been developed, as contained in annex III.

41. The introduction of the monitoring, alarm and control system and the centralized spare parts management system have substantially reduced the number of engineers and technicians that would otherwise be required to operate the telecommunications system. Within the framework of the proposed satellite backbone network project, minimum technical and administrative staffing requirements have been identified for each of the locations and is contained in table 1 below. The use of contracted staff where available from the host national posts and telecommunications authorities, contractual staff and/or temporary assistance would be used to supplement the proposed establishment.

Table 1. Staffing matrix

| Site | Staffing level | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | P-5 | P-4 | P-3 | General Service (Principal level) | General Service (Other level) | Local level | Field Service | Total |
| New York | 1 | 0 | 1 | 2 | 1 | 0 | 0 | 5 |
| Europe | 0 | 1 | 0 | 1 | 6 | 0 | 1 | 9 |
| Addis Ababa | 0 | 1 | 0 | 0 | 0 | 4 | 3 | 8 |
| Nairobi | 0 | 1 | 0 | 0 | 0 | 4 | 3 | 8 |
| Bangkok | 0 | 1 | 0 | 0 | 0 | 4 | 3 | 8 |
| Santiago | 0 | 1 | 0 | 0 | 0 | 4 | 3 | 8 |
| Amman | 0 | 1 | 0 | 0 | 0 | 4 | 3 | 8 |
| Total | 1 | 6 | 1 | 3 | 7 | 20 | 16 | 54 |

42. The implementation, operation and maintenance of the telecommunications system, including the proposed satellite Earth stations, would require a minimum of 54 staff, as indicated in the matrix above, and are distributed among Headquarters and the 6 different locations as follows:

(a) Project implementation team, Headquarters: To ensure successful implementation of the satellite project, the Electronic Services Division of the Office of General Services would establish an implementing team at Headquarters consisting of a Project Manager and a Satellite Engineer at the P-5 and P-3 levels respectively, two General Service staff, one at the principal level and one project management assistant. The implementing team would ensure that the project would successfully accomplish its objectives with minimum delay and cost to the Organization. To cope with the added workload of coordination, line-ups, testing and future operations, one additional General Service staff would be required. The implementing team in the Office of General Services/Electronic Services Division would provide additional technical and managerial backstopping;

(b) Addis Ababa, Bangkok, Santiago, Nairobi and Amman Earth stations: At each regional commission and Nairobi, one manager with telecommunications engineering background (at the P-4 level) to head each Telecommunications Services Unit, supported by three technicians (in the Field Service category) and four local-level staff for administrative support would be required;

(c) European hub Earth stations: One manager with telecommunications engineering background (at the P-4 level), one technician (in the Field Service category) and seven General Service staff, one at the Principal level, would be required to provide technical and administrative support. It should be noted that there would be two satellite Earth stations in Europe and, as a result, additional support staff would be required.

43. In addition to the above, in order to provide adequate technical expert advice on the satellite network and associated systems, it will be necessary to retain individual or institutional contractors at a cost of approximately $534,000 for the 1994-1995 biennium. ITU has already indicated its willingness to provide such experts to the United Nations. Furthermore, since 1994-1995 will be the first biennium for the implementation of the enhanced network, the workload is expected to increase progressively during this period. Therefore, it is proposed that $601,500 in general temporary assistance resources equivalent to approximately 72 General Service (other level) work months in New York and approximately 48 General Service (other level) work months in Europe, and $51,500 for overtime be provided initially, with a view to regularizing the actual requirements based on experience gained as the enhanced network becomes fully operational. Additional staffing for administrative or technical backup will not be required.

## V. PROJECT BUDGET AND IMPLEMENTATION TIMETABLE

44. The project budget, estimated on a biennial basis at current rates in the amount of $20,772,300, is shown in table 2 below. The one-time (non-recurrent) cost required for the acquisition of seven satellite Earth stations, including the second Atlantic Ocean region satellite Earth station at the European hub, the upgrade of the Headquarters Earth stations, a satellite monitoring, alarm and control system at New York and the European hub Earth stations and a set of 15 small portable Earth stations is estimated at $8,739,300. The portable Earth stations will be used for transferring peace-keeping missions traffic from the INMARSAT satellite system to the United Nations backbone network. Based on the staffing matrix indicated in table 1 above and the technical expertise and support staff required, which are outlined in paragraph 41 above, the biennial cost is estimated at $8,389,200. In addition, $3,643,800 would also be required for satellite leases. The total recurrent costs are thus estimated at $12,033,000.

45. Based on the implementation timetable indicated in paragraphs 46 to 49 below, the project cost for 1994-1995 is estimated at $16,928,100 consisting of the recurrent cost of staffing requirements ($4,545,000) and satellite leases ($3,643,800) and non-recurrent costs for the installation of the satellite Earth stations and related cost ($8,739,300). As shown in section VI below, these costs would be more than offset by reduced transmission costs, thereby resulting in a net savings to the Organization. Details of the benefits and savings are also outlined in section VI.

Table 2. Project budget for an enhanced satellite network

(Thousands of United States dollars)

| | Project budget (at current rates) | |
|---|---|---|
| | Biennial costs a/ | 1994-1995 requirements based on phased implementation timetable |
| RECURRENT: | | |
| Salaries and related costs | 8 389.2 | 4 545.0 |
| Satellite leases | 3 643.8 | 3 643.8 |
| Total recurrent | 12 033.0 | 8 188.8 |
| NON-RECURRENT: | | |
| European hub: 2 Earth stations | 1 850.0 | 1 850.0 |
| Addis Ababa | 479.3 | 479.3 |
| Bangkok | 535.2 | 535.2 |
| Santiago | 570.1 | 570.1 |
| Amman | 397.7 | 397.7 |
| Nairobi | 579.3 | 579.3 |
| New York (upgrade) | 500.0 | 500.0 |
| Site preparation | 480.0 | 480.0 |
| 15 portable Earth stations | 1 500.0 | 1 500.0 |
| Subtotal | 6 891.6 | 6 891.6 |
| System integration and installation | 1 755.0 | 1 755.0 |
| Training | 41.2 | 41.2 |
| Travel | 51.5 | 51.5 |
| Subtotal | 1 847.7 | 1 847.7 |
| Total non-recurrent | 8 739.3 | 8 739.3 |
| TOTAL COSTS | 20 772.3 | 16 928.1 |

a/ Excluding costs incurred in 1993 ($112,400), which were met from existing regular budget resources, and maintenance costs ($347,800), which would be required when the guarantee period for the Earth stations has elapsed.

46. The implementation timetable for the proposed satellite network can consist of several phases, organized in such a way as to allow an orderly integration of the improved facilities into the existing structure. For this reason, a multiphased programme is envisaged, to be implemented over a period of approximately three and a half years, for the preparation, system integration, installation and commissioning of facilities.

Phase 1. January-December 1993

47. In order to ensure that the execution of the proposed network could commence without delay during the first quarter of 1993, a staff member in the Electronic Services Division has been temporarily assigned to carry out the initial functions of the project implementation team at Headquarters. The location of the satellite Earth stations and staffing requirements for each of these locations have been identified. Detailed technical specifications of the seven satellite Earth stations, ancillary equipment and standardized operation and maintenance procedures were finalized. The request for proposals for the acquisition of the seven satellite Earth stations and related equipment in Europe, Addis Ababa, Bangkok, Amman, Santiago and Nairobi, including the upgrade of the Earth station in New York, has been prepared and is ready to be issued to vendors. To avoid financial commitment on the part of the Organization prior to the authorization of the General Assembly, the necessary financial clauses have been incorporated in the request for proposals.

Phase 2. September 1994-July 1995

48. During the second phase of the project, Earth stations would be installed in Europe, Addis Ababa and Bangkok; the Earth station at New York would be upgraded. Prior to the award of the contract, action would be taken for the recruitment of core staff in each of these locations. To strengthen the operation at Headquarters, two technicians at the General Service principal level would be required.

Phase 3. August-December 1995

49. During this period, action would be taken for the recruitment of two senior technicians at the Field Service level, one each for the satellite and the switching units, and four local level staff at Addis Ababa and Bangkok and the remaining staff for the European hub station. The Earth stations at Amman, Santiago and Nairobi would be installed. Action would be taken for the recruitment of staff at those duty stations.

## VI. COSTS, BENEFITS AND FINANCING OF THE PROPOSED SATELLITE NETWORK

### A. Benefits of the proposed satellite network

50. The acquisition and installation of the proposed satellite facilities would provide an effective and efficient telecommunications network for the United Nations. In summary, the benefits that the network would provide are as follows:

(a) It would take advantage of the unique status of the United Nations with respect to ITU and INTELSAT;

(b) It would establish a backbone network for peace-keeping missions; the backbone network could be accessed by missions regardless of where they may be located;

(c) The proposed satellite system will provide an integrated digital telecommunications system with capabilities of supporting voice, telex, facsimile, electronic mail, data communications, including the requirements of the Integrated Management Information System (IMIS), and documents handling over the same network, thus providing more reliable and efficient telecommunications in support of all the activities of the Organization;

(d) It would result in substantially lower operating costs as a result of savings in long-distance commercial charges by approximately $13 million per biennium;

(e) It would increase the overall capacity of the system so that traffic of other agencies could be carried on a reimbursable basis, thus resulting in lower telecommunications costs for those agencies participating in the enhanced network.

51. In addition, the installation of the satellite Earth stations will further facilitate the improvements already made in technological innovations. For example the digital PABX at Headquarters and the United Nations offices at Geneva and Nairobi and those expected to be installed at Addis Ababa, Bangkok and Santiago will require the satellite network for continuous transmission at the lowest cost. The cost of data communications through the local area network (LAN) between Headquarters and overseas offices would be significantly reduced as a result of the installation of the satellite Earth stations.

## B. Savings under the proposed satellite network

52. The total project budget, on a biennial basis if the system had been operational as at 1 January 1994, is estimated at $20,772,300, consisting of non-recurrent capital expenditures ($8,739,300) and recurrent operational costs ($12,033,000). The major expenses associated with the proposed network include acquisition and installation of the Earth stations, site preparation, staffing for the operation of the network and the lease of additional capacity on satellites. It is, however, projected that the total recurrent costs under the proposed network ($12,033,000) would be substantially lower than the communications expenditures amounting to $38.9 million under the existing system, allowing the non-recurrent expenditures ($8,739,300) to be recovered in about one year.

53. As shown in table 3, under the current telecommunications network, the projected 1994-1995 expenditure for long-distance telecommunications by the United Nations is estimated at $38.9 million. As the Earth stations are installed in each of the proposed locations and as they become fully operational, the anticipated savings will begin to be realized. A comparison of

the estimated 1994-1995 expenditures under the current telecommunications system, the estimated expenditures that would have been required with the enhanced satellite system and the potential savings envisaged when the total complement of the satellite network becomes fully operational is also shown in table 3. The recurrent cost of $38.9 million required for transmission facilities would progressively be offset by savings consisting of the following: reduction of leased-line costs by $1.7 million, commercial carrier networks by $1.8 million and post, telegraph and telecommunication and INMARSAT charges by $15.6 million. These savings would be partly offset by an increase of $3 million required for satellite leases and $8.3 million for salaries and other charges, and by $8.7 million for non-recurrent equipment and related costs. Once the capital costs of acquisition and installation of the Earth stations are completed, the biennial savings to be derived from the implementation of the enhanced network is estimated at approximately $7.8 million. Details of the savings are discussed in the following paragraphs.

Leased circuits

54. Under existing United Nations leased circuits, the total 1992-1993 recurring expenditures are estimated at $3,573,700 for two-way leased circuits from Addis Ababa, Bangkok, Nairobi, Santiago, Geneva, Vienna and Paris to New York. The replacement of leased circuits with the satellite network for Addis Ababa, Bangkok, Nairobi, Santiago and three of the European leased circuits will eliminate recurring expenditures, estimated at $1,764,000 for the rental of these circuits, once the proposed system is fully operational. The existing and proposed leased-lines configurations are given in annex IV.

Commercial carrier networks

55. Based on expenditure patterns in 1992-1993, it is estimated that the total expenditure for commercial carrier networks (cables, telexes and long-distance telephone) would amount to $11,929,000 per biennium. The complete installation of the satellite network and configuration of the digital switches will direct approximately 15 per cent of the global commercial carrier traffic to the proposed satellite network. The potential global savings for the United Nations are thus estimated at $1,789,400, under various offices.

Peace-keeping operations

56. Currently, telecommunications requirements of peace-keeping missions are being provided by the United Nations Earth stations, INMARSAT and national telecommunications networks. The costs associated with the utilization of INMARSAT terminals and national posts and telecommunications authorities network facilities are extremely high, averaging $6.50 per minute. For example, the average telecommunications cost of a peace-keeping mission, consisting of utilization of INMARSAT and national posts and telecommunications authorities Earth stations is approximately $811,000 per month. Each time a new peace-keeping mission is established it requires both domestic and international telecommunications services. These requirements are usually met by installing a hub Earth station and an international gateway exchange to link the mission activities with United Nations Headquarters and other international destinations. The installation of a 4.5 to 7-metre hub Earth station normally

Table 3. Long-distance telecommunications costs and potential savings

| | Estimated expenditures in 1994-1995 under present technology | | Comparative expenditures for 1994-1995 under proposed system | | Difference | | Comparative expenditures for 1996-1997 under proposed system (at 1994-1995 rates) | Projected savings for 1996-1997 (at 1994-1995 rates) |
|---|---|---|---|---|---|---|---|---|
| | Thousands of US dollars | Percentage | Thousands of US dollars | Percentage | Thousands of US dollars | Percentage | Thousands of US dollars | Thousands of US dollars |
| A. RECURRENT COMMUNICATIONS EXPENDITURES | | | | | | | | |
| REGULAR BUDGET | | | | | | | | |
| Leased circuits | 3 573.7 | | 1 809.7 | | (1 764.0) | | 1 809.7 | (1 764.0) |
| Commercial network | 11 929.0 | | 10 139.6 | | (1 789.4) | | 10 139.6 | (1 789.4) |
| Satellite lease | 631.5 | | 631.5 | | - | | 631.5 | - |
| Total, regular budget | 16 134.2 | 41.4 | 12 580.8 | - | (3 553.4) | 22.0 | 12 580.8 | (3 553.4) |
| PEACE-KEEPING MISSIONS | | | | | | | | |
| INMARSAT and national PTTs | 22 802.8 | 58.6 | 7 202.8 | | (15 600.0) | 68.4 | 7 202.8 | (15 600.0) |
| Subtotal | 38 937.0 | | 19 783.6 | | (19 153.4) | | 19 783.6 | (19 153.4) |
| B. ADDITIONAL COST OF THE IMPLEMENTATION OF THE SYSTEM | | | | | | | | |
| Earth stations and related costs | | | 8 739.3 | | 8 739.3 | | 7 253.7 | 7 253.7 |
| Posts | | | 7 253.7 | | 7 253.7 | | 1 135.5 | 1 135.5 |
| Other staff costs | | | 1 135.5 | | 1 135.5 | | - | - |
| Additional satellite | | | 3 012.3 | | 3 012.3 | | 3 012.3 | 3 012.3 |
| Subtotal | | | 20 140.8 | | 20 140.8 | | 11 401.5 | 11 401.5 |
| NET TOTALS | 38 937.0 | | 39 924.4 | | 987.4 | | 31 185.1 a/ | (7 751.9) |

a/ Excluding recurrent maintenance costs amounting to $347,800 that would be required when the guarantee period for the Earth stations has elapsed.

Table 4 (a). United Nations enhanced telecommunications system: total project costs (at 1994-1995 rates) on a biennial basis a/

(Thousands of United States dollars)

| | Total biennial project costs, 1994-1995 | Expenditure sections | | | Contributions from peace-keeping missions |
|---|---|---|---|---|---|
| | | Total regular budget, 1994-1995 | To be met from existing resources | Additional, 1994-1995 | |
| Recurrent: | | | | | |
| Posts | 7 253.7 | 5 262.6 | (4 717.7) | 544.9 | 1 991.1 |
| Other staff costs | 1 135.5 | 1 135.5 | (1 135.5) | | |
| Satellite leases | 3 643.8 | 631.5 | (631.5) | - | 3 012.3 |
| Total recurrent | 12 033.0 | 7 029.6 | (6 484.7) | 544.9 | 5 003.4 |
| Earth stations | | | | | |
| Geneva | 1 850.0 | | | | 1 850.0 |
| Addis Ababa | 479.3 | 479.3 | (479.3) | | |
| Bangkok | 535.2 | 535.2 | (535.2) | | |
| Santiago | 570.1 | 570.1 | | 570.1 | |
| Amman | 397.7 | 397.7 | | 397.7 | |
| Nairobi | 579.3 | 579.3 | | 579.3 | |
| New York (upgrade) | 500.0 | | | | 500.0 |
| 15 portable | 1 500.0 | | | | 1 500.0 |
| Site preparation | 480.0 | 480.0 | (120.0) | 360.0 | 120.0 |
| Subtotal | 6 891.6 | 3 041.6 | (1 134.5) | 1 907.1 | 3 970.0 |
| Other costs | | | | | |
| System integration and installation | 1 755.0 | 755.0 | | 755.0 | 1 000.0 |
| Factory training | 41.2 | 41.2 | | 41.2 | |
| Travel | 51.5 | 51.5 | | 51.5 | |
| Satellite leases | | | | | |
| Subtotal | 1 847.7 | 847.7 | | 847.7 | 1 000.0 |
| Total non-recurrent | 8 739.3 | 3 889.3 | (1 134.5) | 2 754.8 | 4 970.0 |
| Total 1994-1995 | 20 772.3 | 10 918.9 | (7 619.2) | 3 299.7 | 9 973.4 |

a/ If the system had been operational as at 1 January 1994.

Table 4 (b). Estimated additional recurrent biennial cost and savings under communications if the system were fully operational

(Thousands of United States dollars)

| | Regular budget | Peace-keeping missions | Total expenditure | Projected savings | Net cost savings |
|---|---|---|---|---|---|
| Salaries and related costs | 544.9 | 1 991.1 | 2 536.0 | | 2 536.0 |
| Satellite leases | | 3 012.3 | 3 012.3 | | 3 012.3 |
| Leased circuits (regular budget) | | | | (1 764.0) | (1 764.0) |
| Commercial network (regular budget) | | | | (1 789.4) | (1 789.4) |
| INMARSAT and national posts and telecommunications authorities (Peace-keeping) | | | | (15 600.0) | (15 600.0) |
| Total | 544.9 | 5 003.4 | 5 548.3 | (19 153.4) | (13 605.1) |

takes between four to six months. The capital cost for the installation of a hub Earth station and the international gateway exchange (excluding the domestic network) is in the range of $500,000. Depending on the immediate needs of the mission, its size and the urgency required for it to be operational, the hub stations and associated equipment are leased from INMARSAT or other satellite system services providers at very high cost until the mission network becomes available.

57. While it is recognized that the proposed satellite backbone network will not totally eliminate the need for the construction of hub Earth stations for future missions, it will, however, substantially reduce each individual mission's telecommunications capital budget by using the two European hub stations and the upgraded New York Earth stations.

58. Based on the number of peace-keeping missions established to date, it is projected that the 1994-1995 expenditures will amount to $22,802,800 for INMARSAT, national posts and telecommunications authorities and other leases. The potential savings related exclusively to peace-keeping operations are estimated at $15,600,000.

## C. Proposed funding for the satellite network

59. There are two possible methods of acquiring the Earth stations systems: (a) direct purchase of the Earth stations system; and (b) lease arrangements with the vendor, with an option to buy. A lease arrangement is particularly attractive when the Earth stations are required for only a brief period of time.

Lease charges are generally high. Typically, a vendor's lease charges are designed to recover the purchase price of the equipment over a period of 18 months to 2 years. Should the United Nations decide to lease the backbone satellite network for a period of two years, the estimated lease charges will amount to approximately $413,000 per month, or $9.9 million per biennium. As a result, the total lease charges will equal the purchase price over the two-year period. At the end of the two-year period the United Nations would still not own the equipment but would have an option to buy. Since the proposed satellite network is considered to be a long-term commitment on the part of the Organization, it would be more cost-effective to purchase the Earth stations at the time of installation in order not to incur the lease charges.

60. As shown in table 3 above, the major benefits of the estimated reduction in communications costs expected from the implementation of the proposed satellite network would be the budgets of peace-keeping missions. Accordingly, those budgets should make a significant contribution to the cost of installing and running the network. At the same time, the network would provide significant benefits for activities funded by the regular budget of the Organization, which are also likely to generate a more stable demand for telecommunications facilities than peace-keeping operations, whose requirements are inherently more difficult to predict and programme.

61. In the light of these considerations, the various cost elements of the implementation and operation of the network were reviewed. As shown in table 5 below, the estimated requirements for the 1994-1995 biennium amount to $16,928,100, of which $8,188,800 is recurrent and $8,739,300 is non-recurrent. Based on the cost-sharing arrangements proposed, the distribution of these costs would be $8,312,400 for the regular budget (of which $4,423,100 is recurrent and $3,889,300 non-recurrent) and $8,615,700 for the budgets of the peace-keeping missions (consisting of the one-time cost of the acquisition and installation of satellite Earth stations; additional satellite leases; and the contributions from the missions' budget for the 1994-1995 cost of additional staffing required). These proposals are set out below:

Regular budget

62. Of the 54 posts required for the operation and maintenance of the Earth stations, it is proposed to meet from the regular budget the cost of 29 posts ($2,349,100): 1 P-5, 1 P-4, 1 P-3, 10 General Service (3 at the principal level) and 16 Field Service. In addition, provision would also be made under the regular budget for adequate technical expertise and support staff ($1,135,500) and a portion of the rental of satellite leases ($631,500). Non-recurrent requirements, estimated at $3,889,300, would be required for the installation of the satellite Earth stations at the regional commissions in Addis Ababa, Bangkok, Santiago and Amman and the United Nations Office at Nairobi ($2,561,600); the full cost of factory training and travel requirements ($92,700); and a share in the cost of site preparation and system integration and installation ($1,235,000).

63. Of the 29 posts proposed to be funded from the regular budget, however, it is estimated that the cost of 25 posts could be met either from within existing resources or through redeployments. These are as indicated below:

Table 5. United Nations enhanced telecommunications system

(Estimated 1994-1995 cost and proposed funding)

(Thousands of United States dollars)

| | Total 1994-1995 costs | Regular budget | | | Contributions from peace-keeping |
|---|---|---|---|---|---|
| | | Total | To be met from existing resources | Required from the regular budget | |
| **Recurrent costs** | | | | | |
| Posts | 3 409.5 | 2 656.1 | (2 349.1) | 307.0 | 753.4 |
| Other staff costs | 1 135.5 | 1 135.5 | (1 135.5) | - | - |
| Satellite leases | 3 643.8 | 631.5 | (631.5) | - | 3 012.3 |
| Total, recurrent | 8 188.8 | 4 423.1 | (4 116.1) | 307.0 | 3 765.7 |
| **Earth stations** | | | | | |
| Geneva | 1 850.0 | - | - | - | 1 850.0 |
| Addis Ababa | 479.3 | 479.3 | (479.3) | - | - |
| Bangkok | 535.2 | 535.2 | (535.2) | - | - |
| Santiago | 570.1 | 570.1 | - | 570.1 | - |
| Amman | 397.7 | 397.7 | - | 397.7 | - |
| Nairobi | 579.3 | 579.3 | - | 579.3 | - |
| New York (upgrade) | 500.0 | - | - | - | 500.0 |
| 15 portable | 1 500.0 | - | - | - | 1 500.0 |
| Site preparation | 480.0 | 480.0 | (120.0) | 360.0 | - |
| Subtotal | 6 891.6 | 3 041.6 | (1 134.5) | 1 907.1 | 3 850.0 |
| **Other costs** | | | | | |
| System integration and installation | 1 755.0 | 755.0 | - | 755.0 | 1 000.0 |
| Factory training | 41.2 | 41.2 | - | 41.2 | - |
| Travel | 51.5 | 51.5 | - | 51.5 | - |
| Subtotal | 1 847.7 | 847.7 | - | 847.7 | 1 000.0 |
| Total, non-recurrent | 8 739.3 | 3 889.3 | (1 134.5) | 2 754.8 | 4 850.0 |
| Total, 1994-1995 | 16 928.1 | 8 312.4 | (5 250.6) | 3 061.8 | 8 615.7 |

(a) One P-5 and one P-3 at New York would be met by redeployment of existing posts, within the existing establishment of the Electronic Services Division, to provide for the requirements of the project implementing team at Headquarters;

(b) At Europe, six General Service posts (one at the principal level) could be provided from existing posts in the Telecommunications Operations Unit at the United Nations Office at Geneva. The cost of the P-4 post would be met by the reclassification of an existing P-3 post to the P-4 level;

(c) Sixteen posts in the Field Service category would be met from the Field Service posts already redeployed from the Field Operations Division to the regional commissions (ESCAP, ECLAC, ECA and ESCWA) and the United Nations offices at Geneva and Nairobi.

In connection with the regular budget's share of the cost of satellite leases ($631,500), under existing contractual arrangements with INTELSAT, these provisions are currently available under section 25D, Office of General Services. As to the non-recurrent requirements for the installation and related costs of the satellite Earth stations ($3,886,600), provisions for the satellite Earth stations at Addis Ababa and Bangkok ($1,134,500) have been included in the total project cost of the construction projects at those locations.

64. On that basis, the total additional costs during 1994-1995 under the regular budget have been estimated at $3,061,800, of which $307,000 is recurrent and $2,754,800 is non-recurrent. Once operational, the system is expected to generate savings of $3,553,400 per biennium from reduced recourse to commercial networks and the rental of leased circuits.

65. In connection with income from telecommunications, estimated under income section 2 of the proposed programme budgets of previous bienniums, the percentage share credited to general income was determined in 1978 when the United Nations telecommunications network consisted of leased commercial circuits, supplemented by United Nations-owned high-frequency radio teleprinter networks in a number of locations. All offices used the common public or commercial telephone and telex systems for the dispatch of communications to areas and offices not covered by leased circuits or high-frequency radio. Since that time, substantial investments have been made in upgrading the hardware and software associated with telecommunications services. Leased circuits have been upgraded to provide digital service whereby the Organization has substantially increased the capacity of its leased circuits, including the installation of a new telephone system in New York during the 1980s and those expected to be installed shortly in Europe, Addis Ababa, Bangkok and Nairobi.

66. The installation of the enhanced satellite network and improvements in the communication system would substantially reduce the requirements for rented equipment and facilities, which was, for the most part, used as the basis in determining the amount that was to be credited to income section 2. However, in order to allow for the progressive development and operation of the global United Nations telecommunications network and be responsive to the needs of user organizations, and at the same time maintain competitive rates with those of commercial carriers, it would be necessary to invest resources to provide for

such expansion. Accordingly, it is proposed that as from 1994 all income from telecommunications be credited into a special account to be established for that purpose. Proposed expenditures from this account would be reviewed and approved by the General Assembly in the context of the review and approval of the proposed programme budget.

67. Once the capital investments to expand the network are completed, the income from the global telecommunications system should increase progressively with expanded usage by the specialized agencies and others in the common system. A sample survey conducted by the United Nations on system-wide telecommunications expenditures at 23 locations has revealed that approximately $40 million is spent for telecommunications and the overall system-wide expenditure for this purpose is estimated at over $100 million. There is a strong impetus, therefore, seriously to consider alternatives to the current commercial carriers facilities being used. Once the backbone satellite network is established, the global telecommunications network can be developed using the income from telecommunications as proposed above.

Peace-keeping missions

68. Since the peace-keeping missions would be the primary user and beneficiary of the European hubs in both the Atlantic Ocean and Indian Ocean regions and the upgrade of the Headquarters facilities is considered necessary owing to the continuing increase in peace-keeping activities, it is proposed to fund the installation of the satellite Earth stations and related costs, at the European hub and the upgrade of the New York facilities, in addition to the 15 portable Earth stations required by peace-keeping operations, from savings to be derived under the communications budget of the peace-keeping missions. Aside from the benefits and savings to be derived, which have been detailed in the preceding paragraphs, the total non-recurrent cost, estimated at $5,420,000, would also eliminate the need to incur the capital cost of installing a hub Earth station (estimated at $500,000 each) every time a peace-keeping mission is established; or the rental of an Earth station, should an immediate need arise, which costs approximately $40,000 per month or $480,000 per annum.

69. Furthermore, as the operation and management of the Earth stations in each of the field offices would be primarily directed towards providing full support to the activities of the peace-keeping missions, it would appear appropriate that the managers of the telecommunications services units at those locations (proposed at the P-4 level) and the related local support staff be funded from contributions from the peace-keeping missions' budgets. The 1994-1995 recurrent requirements, including provisions for the peace-keeping missions' share of the cost of the satellite leases, are estimated at $3,765,700.

70. Compared to the estimated savings in the communications costs of those missions amounting to approximately $15.6 million, the estimated contribution from peace-keeping missions' budgets amounts to approximately $8.6 million. Once these Earth stations have been installed, the communications requirements for each peace-keeping mission could be drastically reduced.

## VII. SUMMARY AND PROPOSALS FOR 1994-1995

71. As indicated in table 5 above, the 1994-1995 requirements for the implementation of the satellite Earth stations are estimated at $16,928,100, of which $8,739,300 is non-recurrent and $8,188,800 is recurrent. Of the total non-recurrent requirements, $3,889,300 would be borne by the regular budget. Provisions of $1,134,500 relating to the cost of the satellite Earth stations at Addis Ababa and Bangkok have already been included in the total cost of the construction projects at those locations. The provisions for the Earth stations at Santiago, Amman and Nairobi, including the regular budget's share of the related costs, estimated at $2,754,800, being requested under section 30, Construction, alteration, improvement and major maintenance, would constitute a reinstatement of the Secretary-General's initial request of $2,853,900 rather than an addition to the programme budget for the biennium 1994-1995. The 1994-1995 contributions required from peace-keeping missions for non-recurrent requirements, estimated at $4,850,000, relate to the satellite Earth stations for the European hub, the upgrade of the Earth station at New York, 15 portable Earth stations, and related costs.

72. The total recurrent requirements have been estimated at $8,188,800, of which $4,423,100 would be funded from the regular budget. However, $4,116,100 of these requirements would be met from resources already existing in the programme budget for the biennium 1994-1995. The net recurrent additional costs for the biennium 1994-1995 under the regular budget are thus estimated at $307,000. The peace-keeping operations' share of the 1994-1995 recurrent costs are estimated at $3,765,700. Of that amount, however, $3,012,300, relating to satellite leases, is already budgeted under existing peace-keeping operations' budgets. The additional amount required from contributions from the peace-keeping operations' budgets is thus estimated at $753,400, representing the cost of posts required in 1994-1995. The distribution of these posts is contained in the table below.

73. When the system becomes operational, it is anticipated that biennial communications expenditures under the regular budget would amount to $12.5 million as compared to $16.1 million, and that, in respect of peace-keeping operations, current biennial expenditures for communications, $22.8 million, would be reduced to $7.2 million. On that basis, it is estimated that the one-time cost of the acquisition and installation of the Earth stations could be recovered within a year from savings under communications requirements of both the regular budget and the budgets of peace-keeping missions. As to the recurrent requirements for peace-keeping missions, they would be substantially less than at present.

74. The approval of the General Assembly is therefore sought (a) to proceed with the implementation of the proposed network; and (b) to utilize appropriations under communications in the budgets of peace-keeping operations as contributions by these operations to the cost of the network. The Assembly would also need to approve an additional appropriation of $307,000 under section 25, Administration and management, for the biennium 1994-1995 consisting of four new General Service posts: two at the principal level at Headquarters in New York and two General Service, other level (one at the United Nations Office at Geneva and one at Headquarters in New York). The additional

Table 6. Distribution of posts required in 1994-1995

| | Total posts required | To be met from existing resources | Contribution from peace-keeping | New regular budget posts required |
|---|---|---|---|---|
| P-5 | 1 | (1) | - | - |
| P-4 | 6 | - | (5) | 1 |
| P-3 | 1 | (2) | - | (1) |
| GS (principal level) | 3 | (1) | - | 2 |
| GS (other level) | 7 | (5) | - | 2 |
| Field Service | 16 | (16) | - | - |
| Local level | 20 | - | (20) | - |
| Total | 54 | (25) | (25) | 4 |

requirement of $2,754,800 under section 30 would constitute a reinstatement of the Secretary-General's initial request rather than an addition to the programme budget for the biennium 1994-1995.

75. In addition, an amount of $99,400 would be required under section 28, Staff assessment, to be offset by a corresponding amount under income section 1, Income from staff assessment.

76. Based on experience gained during the biennium 1994-1995, proposals on the funding of the recurrent costs, currently being proposed to be funded from peace-keeping operations, would depend on the level of peace-keeping activities during future bienniums. Consideration would also be given to the funding of these recurrent costs from income to be generated under telecommunications. Future proposals in this connection would be included in the Secretary-General's proposals on the programme budget for the biennium 1996-1997.

ANNEX I

Comparison of telephone rates

Calls originating in New York

(Standard rates)

| Destination | Published commercial rates 1 minute | Special United Nations volume discounts 1 minute | United Nations network rate 1 minute |
|---|---|---|---|
| Angola | 3.98 | 2.08 | 0.85 |
| Ethiopia | 3.12 | 1.77 | 0.85 |
| Somalia a/ | 4.91 | 8.41 | 0.85 |
| Kenya | 2.71 | 1.45 | 0.85 |
| Iraq | 3.46 | 1.85 | 0.85 |
| Israel | 2.98 | 1.55 | 0.85 |
| Kuwait | 3.19 | 1.46 | 0.85 |
| Lebanon | 3.23 | 3.23 | 0.85 |
| Syrian Arab Republic | 2.95 | 1.58 | 0.85 |
| Cyprus | 2.23 | 1.20 | 0.85 |
| Thailand | 3.96 | 1.80 | 0.85 |
| Pakistan | 4.45 | 2.02 | 0.85 |
| Cambodia | .. | .. | 0.85 |
| Austria | 1.83 | 0.89 | 0.85 |
| France | 1.71 | 0.74 | 0.85 |
| Switzerland | 1.94 | 0.86 | 0.85 |
| Chile | 2.27 | 1.09 | 0.85 |
| El Salvador | 2.25 | 1.21 | 0.85 |

Source: General commercial rate based on AT&T International Telecommunications Guide 1/92.

a/ Operator assisted - no direct dial.

ANNEX II

Comparison of sample telex rates

Post, telegraph and telecommunications/Commercial Carrier versus United Nations network

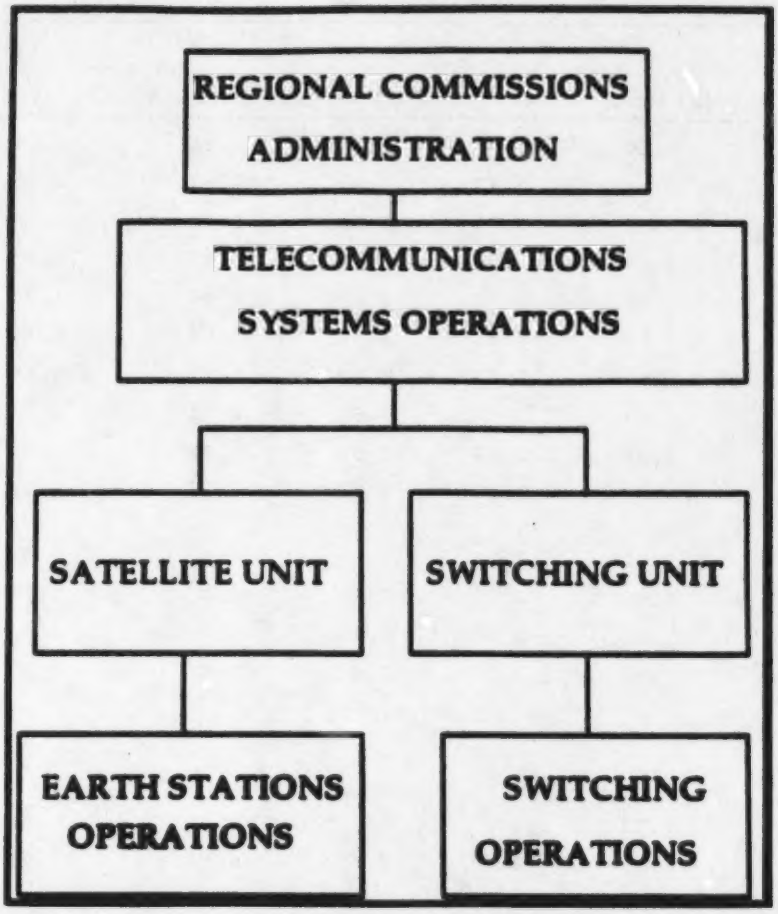
(Charges per minute)

| From to | Ethiopia | Thailand | Chile | Switzerland | New York | |
|---|---|---|---|---|---|---|
| | | | | | Commercial | UNNET |
| Angola | 1.89 | 2.77 | 3.52 | 2.51 | 2.03 | 1.20 |
| Ethiopia | | 2.77 | 3.52 | 2.51 | 2.03 | 1.20 |
| Somalia | 1.42 | 2.77 | 3.52 | 2.51 | 2.07 | 1.20 |
| Kenya | 0.7 | 2.77 | 3.52 | 2.51 | 1.64 | 1.20 |
| Cyprus | 1.42 | 2.77 | 2.64 | 0.46 | 1.39 | 1.20 |
| Iraq | 1.89 | 2.37 | 3.52 | 2.51 | 1.64 | 1.20 |
| Israel | 1.42 | 2.37 | 3.52 | 1.32 | 1.64 | 1.20 |
| Kuwait | 1.89 | 2.37 | 3.52 | 2.51 | 1.64 | 1.20 |
| Lebanon | 1.89 | 2.37 | 3.52 | 1.32 | 1.43 | 1.20 |
| Syrian Arab Republic | 1.89 | 2.37 | 3.52 | 1.32 | 2.03 | 1.20 |
| Austria | 1.42 | 2.77 | 2.64 | 0.4 | 1.39 | 1.20 |
| France | 1.42 | 2.77 | 2.64 | 0.4 | 1.39 | 1.20 |
| Switzerland | 1.42 | 2.77 | 2.64 | | 1.39 | 1.20 |
| United Kingdom of Great Britain and Northern Ireland | 1.89 | 2.37 | 2.64 | 0.46 | 1.07 | 1.20 |
| Chile | 1.89 | 2.77 | | 2.51 | 1.66 | 1.20 |
| El Salvador | 2.36 | 2.77 | 2.64 | 2.51 | 1.66 | 1.20 |
| New York | 1.89 | 2.37 | 2.64 | 1.32 | | |
| Cambodia | N/A | N/A | N/A | N/A | N/A | 1.20 |
| Pakistan | 1.89 | 1.98 | 3.52 | 2.51 | 1.43 | 1.20 |
| Thailand | 1.89 | | 3.52 | 2.51 | 2.02 | 1.20 |

Note: N/A Commercial telex not available at this time. Dollars conversion per United Nations operational rates of exchange for United Nations programmes. National posts and telecommunications authorities rates based on World Telecommunications Tariff Directory, volume 5. UNNET rate of $1.20 per minute based on IMX billing charges of $0.02 per word at 60 wpm.

ANNEX III

Proposed organizational structure model for telecommunications sections at the regional commissions and Nairobi



ANNEX IV

Existing 1992-1993 leased circuits (lines) and proposed configurations

UNITED NATIONS LEASED CIRCUITS

| EXISTING CONFIGURATIONS | | | | | | PROPOSED CONFIGURATIONS | | | | | | Estimated biennial savings in leased lines |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TWO-WAY CIRCUITS | | | CHARGES (US$) | | | TWO-WAY CIRCUITS | | | CHARGES (US$) | | | |
| FROM | TO | Unit | United States | Foreign | Biennium totals | FROM | TO | Unit | United States | Foreign | Biennium totals | |
| Addis Ababa | NY | 2 | 4 820 | 8 904 | 329 376 | | | | | | | 329 376 |
| Bangkok | NY | 1 | 2 680 | 10 198 | 309 063 | | | | | | | 309 063 |
| Nairobi | NY | 1 | 2 410 | 3 677 | 146 095 | | | | | | | 146 095 |
| Santiago | NY | 1 | 3 400 | 5 600 | 216 000 | | | | | | | 216 000 |
| Vienna | NY | 2 | 3 020 | 14 595 | 422 750 | | | | | | | 422 750 |
| Subtotal | NY | 7 | 16 330 | 42 974 | 1 423 284 | | | | | | | 1 423 284 |
| Geneva | NY | 2 | 6 040 | 13 685 | 473 408 | Geneva | NY | 1 | 3 020 | 6 843 | 236 712 | 236 696 |
| | | | | | | Vienna | Geneva | 1 | | 6 843 | 164 232 | -164 232 |
| Copenhagen | NY | 1 | 3 020 | 11 216 | 341 667 | Copenhagen | Geneva | 1 | | 11 216 | 269 184 | 72 480 |
| Paris | NY | 1 | 3 020 | 7 815 | 260 035 | Paris | Geneva | 1 | | 7 815 | 187 560 | 72 480 |
| Rome | NY | 1 | 1 510 | 9 498 | 264 200 | Rome | Geneva | 1 | | 9 498 | 227 952 | 36 240 |
| London | NY | 1 | 1 510 | 3 597 | 122 571 | London | Geneva | 1 | | 3 597 | 86 328 | 36 240 |
| Network management equipment | | | | | 520 200 | Network management equipment | | | | | 520 200 | 50 800 |
| SUBTOTALS | | 6 | 15 100 | 45 812 | 1 982 081 | | | 6 | 3 020 | 45 812 | 1 171 968 | 340 704 |
| TOTAL | | 13 | 31 430 | 88 785 | 3 405 366 | | | 6 | 3 020 | 45 812 | 1 171 968 | 1 763 988 |
| Satellite capacity leased | | | | | 510 000 | | | | | | | |
| TOTAL, leases | | | | | 3 915 366 | | | | | | | |
| Less UNICEF Copenhagen line | | | | | 341 667 | | | | | | | |
| TOTAL, regular budget | | | | | 3 573 699 | | | | | | | |



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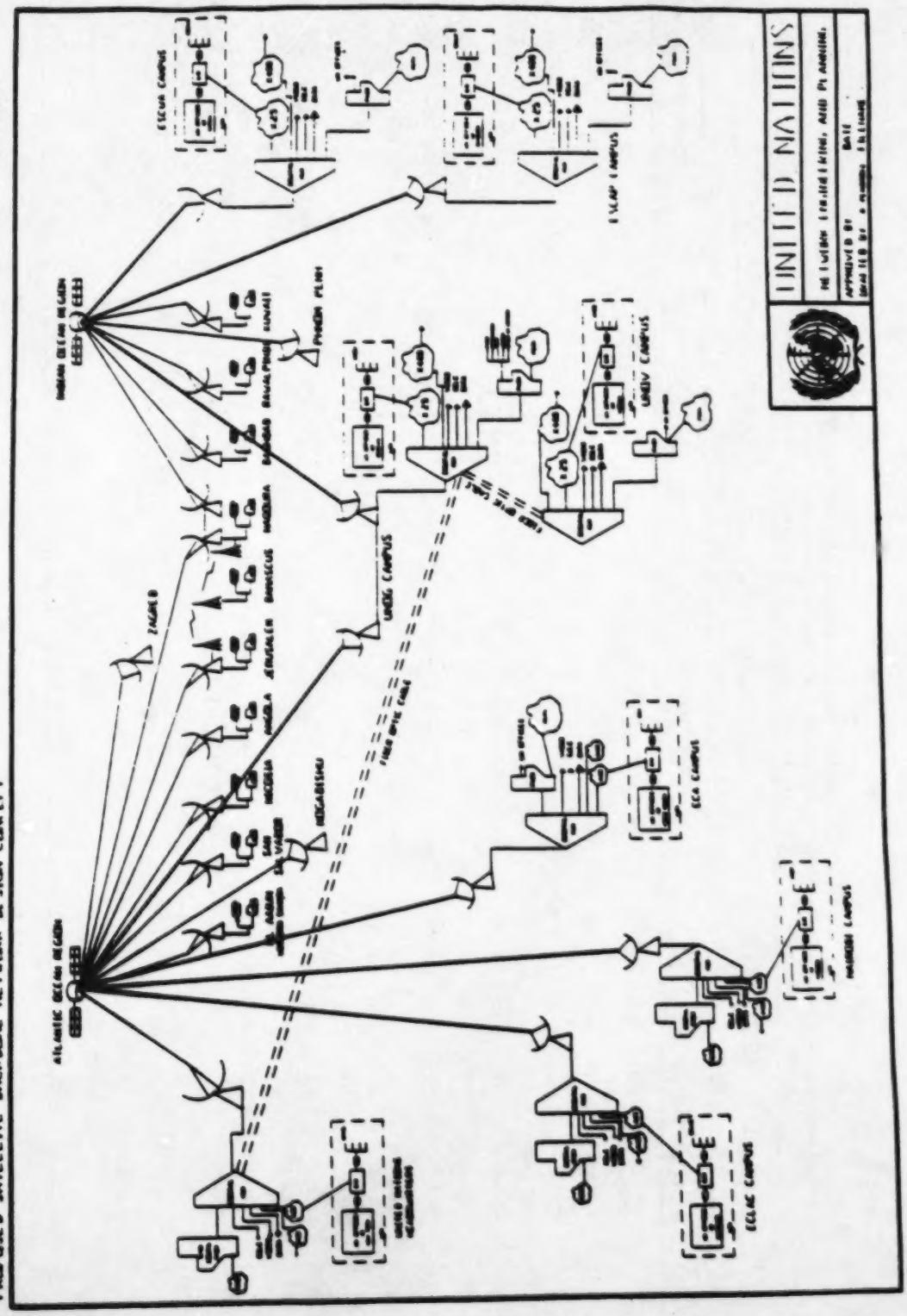
Figure 1


PROPOSED SATELLITE BACKBONE NETWORK DESIGN CONCEPT
EXISTING
PROPOSED
UNITED NATIONS
ATLANTIC OCEAN REGION
INDIAN OCEAN REGION
ECLAC CAMPUS
UNEP CAMPUS
UNDP CAMPUS
UNOG CAMPUS
UNDC CAMPUS
ECA CAMPUS
UNCTAD CAMPUS
ESCWA CAMPUS
ESCAP CAMPUS
ESCAP
ESCWA
UNCTAD
UNDP
UNEP
UNOG
UNDC
ECA
ECLAC
NAIROBI
GENEVA
NEW YORK
BANGKOK
BAHRAIN
SANTIAGO
ADDIS ABABA
BEIRUT
PHNOM PENH
KUWAIT
MANAMA
DAMASCUS
AMMAN
ARUSHA
LUSAKA
ANGOLA
NIGERIA
SAN SALVADOR
MOGADISHU
FIBRE OPTIC LINK

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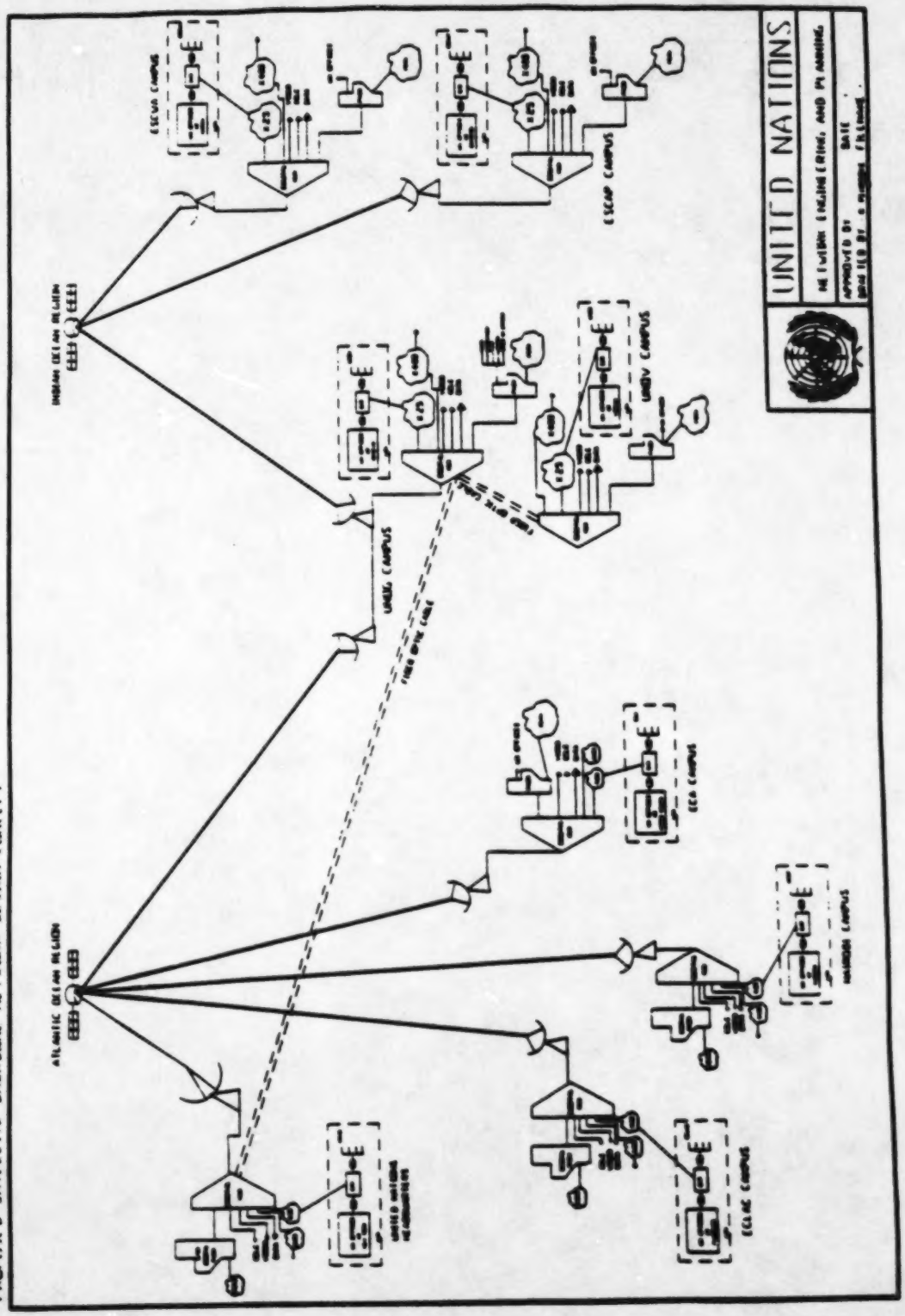
PROPOSED SATELLITE BACKBONE NETWORK DESIGN CONCEPT

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